

Inorganic Chemistry, Radiochemistry and Radiopharmacy

Inorganic and Organometallic Chemistry

Journals

M.A. Antunes, A. Domingos, I. Cordeiro dos Santos, N. Marques, J. Takats, Synthesis and Characterization of Uranium(III) Compounds Supported by the Hydrotris(3,5-dimethyl-pyrazolyl)borate Ligand. Crystal Structures of $[U(Tp^{Me_2})_2(X)]$ Complexes ($X = OC_6H_2-2,4,6-Me_3$, dmpz, Cl), *Polyhedron* 24 (2005) 3038-3045.

M. Silva, M.A. Antunes, M. Dias, A. Domingos, I. Cordeiro dos Santos, J. Marçalo, N. Marques, The Uranium-Nitrogen Bond in U(IV) Complexes Supported by the Hydrotris(3,5-dimethylpyrazolyl) borate Ligand, *Dalton Trans.* (2005) 3353-3358.

J.K. Gibson, R.G. Haire, M. Santos, J. Marçalo, A. Pires de Matos, Oxidation Studies of Dipositive Actinide Ions, An^{2+} ($An = Th, U, Np, Pu, Am$) in the Gas Phase: Synthesis and Characterization of the Isolated Uranyl, Neptunyl, and Plutonyl Ions $UO_2^{2+}(g)$, $NpO_2^{2+}(g)$, and $PuO_2^{2+}(g)$, *J. Phys. Chem. A* 109 (2005) 2768-2781.

J.K. Gibson, R.G. Haire, J. Marçalo, M. Santos, A. Pires de Matos, J.P. Leal, Determination of the Ionization Energy of NpO_2 and Comparative Ionization Energies of Actinide Oxides, *J. Nucl. Mat.* 344 (2005) 24-29.

M.H. Casimiro, M.L. Botelho, J.P. Leal, M.H. Gil, Study on Chemical, UV and Gamma Radiation Induced Grafting of 2-Hydroxyethyl Methacrylate onto Chitosan, *Rad. Phys. Chem.* 72 (2005) 731-735.

M.H. Casimiro, J.P. Leal, M.H. Gil, Characterization of Gamma Irradiated Chitosan/pHEMA Membranes for Biomedical Purposes, *Nucl. Instr. Meth. Phys. Res., Sect. B*, 2005, 236, 482-487.

C. Hipólito, J. P. Leal, Standard Molar Enthalpies of Formation of Li, Na, K, Rb and Cs Methylphenoxides, *Thermochim. Acta* 429 (2005) 125-131.

Conference Proceedings

J. Branco, J.P. Leal, N.R. Pinhão, A. Pires de Matos, Sistema de Tratamento de Resíduos Plásticos em Leito de Metal Fundido, *1st Int. Congress of Energy and Environment Engineering and Management*, Portalegre, Portugal, May 2005, Ed. CD ROM.

Other Publications

M.H. Casimiro, J.P. Leal, M.H. Gil, C.A. Nieto de Castro, Análise Calorimétrica Aplicada a Polímeros Biológicos. Parte I: Fundamentos Teóricos, *Química -*

Boletim da Sociedade Portuguesa de Química 98 (2005) 29-35.

M. Pinheiro, J.P. Leal, Testes e Exercícios - Química - 12.º ano, *Química - Boletim da Sociedade Portuguesa de Química* 99 (2005) 15.

Reports

A. Pires de Matos, J. Branco, J.P. Leal, J. Marçalo, N. Pinhão, Tratamento e Valorização de Resíduos Plásticos, 2 - Obtenção do Metanol a partir do Gás de Síntese, *ITN Internal Report QUI-01-2005*.

L.M. Ferreira, M.H. Casimiro, Dosimetry and Gamma Irradiation Tests of Insulator Materials – 2nd Load of Samples, *CERN Collaboration Report* (2005).

M.L. Botelho, J. Branco, S. Cabo Verde, R. Melo, L. Alves, Impact of Electron Beam and Gamma Radiation on Treatment of Waste Water and Drinking Water: Comparative Studies, *IAEA Report (Contract n° 12017)*, Nov. 2005, pp 1-52.

Patents

A. Pires de Matos, J.P. Leal, J. Branco, N. Pinhão, Sistema de Tratamento de Resíduos Plásticos em Leito de Metal Fundido, *Portuguese Patent* PT 103302.

Communications

J.K. Gibson, R.G. Haire, J. Marçalo, M. Santos, A. Pires de Matos, Bonding in Actinide Complexes - Actinide Ion Chemistry in the Gas Phase, *Actinides 2005*, Manchester, England, July, invited talk.

J.K. Gibson, R.G. Haire, J. Marçalo, M. Santos, A. Pires de Matos, Reactions of Actinide Ions in the Gas Phase: New Issues in Molecular Actinide Chemistry, Honolulu, Hawaii, USA, Dec., invited talk.

J.P. Leal, C. Hipólito, Phenoxide Energetics. Alkaline, Alkaline-earth and Lanthanide Compounds, *Transmediterranean Symp. on Organometallic Chemistry and Catalysis, RENACOM 2005*, Marrakech, Marrocos, May, oral.

M.L. Botelho, R. Melo, J. Branco, Slaughterhouse Sewage Treatment Using Gamma Radiation - Economical Feasibility Study; *Int. Nuclear Atlantic Conference (INAC)*, S. Paulo, Brasil, Aug. 28, oral.

O. Schalm, K. Janssens, C. Carvalho, J. Pereira, A. Pires de Matos, Chemical Analysis of Archaeological Glass Fragments, Excavated at the Former Royal Glass Factory of Marinha Grande, Portugal, *Glass*

- Science in Art and Conservation*, Lisboa – Marinha Grande, Portugal, Sep., oral.
- M.A. Antunes, M. Dias, B. Monteiro, A. Carvalho, J.P. Leal, I. Cordeiro dos Santos, A. Domingos, N. Marques, Estudo da Reactividade dos Complexos [U{(SiMe₂NPh)₃-tacn}NR₂], *VI Conf. Química Inorgânica (SPQ)*, Funchal, Madeira, March, poster.
- M.A. Antunes, M. Dias, B. Monteiro, A. Carvalho, J.P. Leal, I. Cordeiro dos Santos, A. Domingos, N. Marques, Reacções de Oxidação do Complexo de Urânio(III), [U{(SiMe₂NPh)₃-tacn}] (tacn = triazaciclononano), *VI Conf. Química Inorgânica (SPQ)*, Funchal, Madeira, March, poster.
- J. Carretas, J. Branco, J. Marçalo, A. Domingos, A. Pires de Matos, X-Ray Characterization of a Mixed-Valence Compound of Europium with Alkoxo and Siloxo Ligands, *VI Conf. Química Inorgânica da Sociedade Portuguesa de Química*, Funchal, Madeira, March-April 2005, poster.
- J. Branco, J. Carretas, A. Pires de Matos, Síntese e Caracterização de Alcóxidos e Arilóxidos Heterometálicos de Lantanídeos como Precursores Catalíticos, *VI Conf. Química Inorgânica (SPQ)*, Funchal, Madeira, March, poster.
- M. Santos, J. Marçalo, A. Pires de Matos, J.K. Gibson, R.G. Haire, Gas-Phase Reactions of Protactinium Cations with Small Alkanes and Alkenes, *Actinides 2005*, Manchester, England, July, poster.
- P. Madeira, M.T. Fernandez, J.P. Leal, Acidez de Dimetoxifenóis na Fase Gasosa, *7º Encontro Nac. Química-Física - SPQ*, Porto, Portugal, May, poster.
- M.H. Casimiro, L.M. Ferreira, J. P. Leal, A. N. Falcão, M. H. Gil, Novos Materiais Poliméricos para Aplicações Biomédicas obtidos por Irradiação Gama, *Física, Tecnologia e Saúde (FiTS)*, ESTeSL, Lisboa, Portugal, May, poster.
- M.A. Reis, P.C. Chaves, J.P. Leal, M.G. Cabeçadas, A.F. Rodrigues, M. Juliano, H. TH. Wolterbeek, PIXE Capabilities for Biogeochemical Cycles Studies in the Northeastern Atlantic, *17th Int. Conf. on Ion Beam Analysis (IBA2005)*, Sevilla, Spain, June, poster.
- M.H. Casimiro, J.P. Leal, M.H. Gil, γ Irradiated Chitosan/pHEMA Membranes for Drug Release Systems, *3rd Iberian Carbohydrate Meeting*, Coimbra, Portugal, Sep., poster.
- T. Almeida Gasche, A.S. Correia, J. Branco, J. Carretas, A. Pires de Matos, Lanthanide Aryloxides: Reactivity with POSS, *The Physics and Chemistry of Matrix Isolated Species*, Funchal, Portugal, Jul, poster.
- L. Machado, R. Melo, J. Branco, N. Pinhão, M.L. Botelho, Aplicação da Cromatografia Iónica no Estudo do Impacto da Radiação Gama em Lamas Provenientes de Águas Residuais de uma Indústria de Tratamento de Carne, *4º Encontro Nac. Cromatografia (SPQ)*, Évora, Portugal, Dec., poster.
- M.L. Botelho, R. Melo, J. Branco, Slaughterhouse Sludge Treatment using Ionizing Radiation - Studies on Sludge as Agriculture Fertilizers, *Int. Chemical Congress of Pacific Basin Societies*, Honolulu, Hawaii, December 15, 2005, poster.

Inorganic and Radiopharmaceutical Chemistry

Journals

- S. Alves, J. D. G. Correia, A. Paulo, L. Gano, J. Smith, I. Santos, Pyrazolyl Containing Ligands as Bifunctional Chelators for Labelling Biomolecules with the *fac*-[M(CO)₃]⁺ Moiety (M=^{99m}Tc, Re): Synthesis, Characterization and Biological Behaviour, *Bioconjugate Chem.* 16 (2005) 438- 449.
- C. Fernandes, J. D. G. Correia, L. Gano, I. Santos, S. Seifert, R. Syhre, R. Bergmann, H. Spies, Dramatic Effect of the Tridentate Ligand on the Stability of ^{99m}Tc 3+1 Oxocomplexes Bearing Arylpiperazine Derivatives, *Bioconjugate Chem.* 16 (2005) 660-668.
- R. Garcia, A. Paulo, A. Domingos, I. Santos, H.-J. Pietzsch, Disruption of Unprecedented B-H...M Agostic Interactions: An Alternative Approach for Labeling Bioactive Molecules, *Synthesis and Reactivity in Inorganic, Metal-Organic and Nano-Metal Chemistry*, 35 (2005) 35- 42.
- R. Garcia, C. Xavier, A. Paulo, I. Santos, T. Kniess, R. Bergmann, F. Wüst, Synthesis and Biological of S-[¹¹C]Methylated Mercaptoimidazole Piperazinyl Derivatives as Potential Radioligands for Imaging 5-HT_{1A} Receptors by Positron Emission Tomography (PET), *J. Labelled Cpd. Radiophr.* 48 (2005) 301-315.
- S. Lacerda, M. P. Campello, I. C. Santos, I. Santos, R. Delgado, A N,N'-Diacetate Benzodioxotetraazamacrocycle and its Transition Metal Complexes, *Polyhedron* 24 (2005) 451-461.
- F. Marques, A. Paulo, M. P. Campello, S. Lacerda, R. Vitor, L. Gano, R. Delgado, I. Santos, Radiopharmaceuticals for Targeted Radiotherapy, *Rad. Prot. Dos.* 116 (2005) 601-604.
- M. A. Santos, M. Gil, S. Marques, L. Gano And S. Chaves, N-Arylamine derivatives of 3-hydroxy-4-pyridinones: Solution studies and Bioevaluation in view of Al-detoxification roles, *Anal Bioanal. Chem.* 381 (2005) 413 - 419.
- M. A. Santos, M. Gil, L. Gano, S. Chaves, Bifunctional 3-Hydroxy-4-Pyridinone Derivatives as Potential Pharmaceuticals: Synthesis, Complexation

with Fe(III), Al(III) and Ga(III) and *in vivo* Evaluation with ^{67}Ga , *J Biol Inorg Chem*, 10 (2005) 564 - 580.

M. A. Santos, S. Gama, L. Gano, E. Farkas, A Bis-(3-hydroxy-4-pyridinone)-EDTA derivative as a Potential Therapeutic Al-Chelating Agent. Synthesis, Metal-Complexation and Biological Assays, *J. Inorg Biochem*, 99, (2005) 1845 - 1852.

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I. Santos, C. Fernandes, Synthesis of Quinazoline Derivatives: Coupling to Different Chelators, Labelling with Different $^{99\text{m}}\text{Tc}$ Cores and *in vitro* and *in vivo* Evaluation, *2nd Research Co-ordination Meeting (RCM) on Development of $^{99\text{m}}\text{Tc}$ Based Small Biomolecules Using Novel $^{99\text{m}}\text{Tc}$ Cores*, IAEA (2005) 120-124.

S. Alves, J. D. G. Correia, I. Santos, C. Decristoforo, R. Alberto, C. J. Smith, *In vitro* and *in vivo* Evaluation of [$^{99\text{m}}\text{Tc}(\text{CO})_3$ -Cyclo[Arg-Gly-Asp-D-Tyr-Lys(pz1)]], *2nd RCM Development of $^{99\text{m}}\text{Tc}$ Based Small Biomolecules Using Novel $^{99\text{m}}\text{Tc}$ Cores* IAEA (2005) 125-138.

Patents

I. Santos, A. Paulo, L. Maria, European Patent: 05077977.6

Communications

P. Campello, L. Gano, F. Marques, S. Lacerda, J. Costa, L. M. P. Lima, R. Delgado, I. Santos, 13 to 14-membered macrocyclic ligands containing methylcarboxylate or methylphosphonate pendant arms: biological evaluation of their ^{153}Sm and ^{166}Ho complexes as potential agents for therapy or bone pain palliation, *COST Action D18, Lanthanides Chemistry for Diagnosis and Therapy*, Annual Workshop, Cologne, Germany, 7-10 Sep., oral.

C. Fernandes, Biocomplexos de $^{99\text{m}}\text{Tc}$ para Imagiologia Molecular de Receptores 5-HT_{1A} e EGFR; Fac. Farmácia, Univ. Lisboa, Sep., invited talk

L. Gano, Good Radiopharmacy Practice, Short-course on the Use of Radioactive Compounds, *IBILI*, Coimbra, Dec., invited talk.

I. Santos, Phase 1: National Coordinator Report, *CETRAD Meeting*, London, UK, January, oral

I. Santos, *CETRAD* final report, Prague, Czech Republic, 9-10 March

I. Santos, Building Blocks Containing the Metal Fragments $[\text{M}=\text{O}]^{3+}$ and $[\text{M}(\text{CO})_3]^+$ for Labelling Biomolecules, *Conf. Radiotracers for in vivo Assessment of Biological Functions, New Directions*, Warsaw, Poland, Cost Action B12, 22-23 April, oral.

I. Santos, On going Projects at ITN, *Mallinckrodt Meeting*, Petten, Netherlands, Sep., oral.

C. Fernandes, L. Gano, J. D. G. Correia, S. Seifert, S. Spies, I. Santos, Novos complexos de $^{99\text{m}}\text{Tc}$ com Elevada Afinidade para os Receptores 5-HT_{1A}, *IV Jornadas do Serviço de Medicina Nuclear do Hospital*

Garcia de Orta: Medicina Nuclear nas Neurociências, Costa da Caparica, 14-15 January, poster.

R. Garcia, L. Maria, C. Xavier, L. Gano, A. Paulo, I. Santos, T. Kniess, F. Wüst, R. Bergmann, Derivados de Mercaptoimidazolos para a Visualização por SPECT e PET de Receptores 5-HT_{1A}, *IV Jorn. Serv. Med. Nucl. Hosp. Garcia de Orta*. Costa da Caparica, 14-15 Jan., poster.

J.D.G. Correia, C. Fernandes, E. Palma, I. Santos, L. Gano, S. Seifert, R. Syhre, R. Bergmann, H. Spies, R. Alberto, Phosphorus Containing Chelators for Labelling 5-HT_{1A} Receptor-Binding Ligands with the $[\text{M}=\text{O}]^{3+}$ and $[\text{M}(\text{CO})_3]^+$ Cores, *Conf. Radiotracers for in vivo Assessment of Biological Functions, New Directions*, Warsaw, Poland, Cost Action B12, 22-23 April, poster.

C. Fernandes, I. Santos, Novel Nuclear Imaging Agents for Targeting Epidermal Growth Factor Receptors (EGFR), *XIV Porto Cancer Meeting, Hormonal and TK Receptors in Breast Cancer*, Porto, Portugal, 14-15 April, poster.

M.C. Oliveira, C. Fernandes, I. Santos, Radioiodination of New EGFR Inhibitors as Potential SPECT Agents for Molecular Imaging of Breast Cancer in *XIV Porto Cancer Meeting*, Porto, Portugal, 14-15 April, poster.

C. J. Smith, S. Alves, I. Santos, G.L; Sieckman, T. J Hoffman, T. Rold, Technetium-I Pyrazolyl Bombesin Conjugates: A Concise *In Vitro/In Vivo* Study, *16th Int. Symp. on Radiopharmaceutical Chemistry*, June 2005, Iowa City, USA, poster.

M. P. Campello, F. Marques, L. Gano, S. Lacerda, R. Delgado, I. Santos, J. Costa, L. M. P. Lima, R. Delgado, Biological Evaluation of Radiolanthanide Complexes with Tetraazamacrocycles for Potencial Bone Pain Palliation *XXX Int. Symp. Macrocyclic Chemistry*, Dresden, Germany, 17-21 July, poster.

A. Paulo, R. Garcia, L. Maria, C. Xavier, I. Santos, T. Kniess, F. Wüst, R. Bergmann, Mercaptoimidazole Derivatives Labelled with $^{11}\text{C}/^{99\text{m}}\text{Tc}$ for the Targeting of 5-HT_{1A} Receptors, *4th Ann. Meeting of Society for Molecular Imaging*, Cologne, Germany, Sep., poster.

R.F. Vitor, A. Paulo, I. Santos, I. Correia, J. C. Pessoa, Design of Fluorescent and radioactive Probes Based on Rhenium and Technetium-99m Complexes Anchored by Pyrazole Containing Chelators, *4th Ann. Meeting of Society for Molecular Imaging*, Cologne, Germany, Sep., poster.

F. Marques, L. Gano, M P Campello, S. Lacerda, J. Costa, R. Delgado, I. Santos, Biological evaluation of ^{153}Sm and ^{166}Ho complexes with macrocyclic ligands containing acetate pendant arms as potential agents for therapy, *Int. Symp. Trends in Radiopharmaceuticals (ISTR-2005)*, Viena, Austria, 14-18 Nov., poster.

S. Gama, M. Gil, L. Gano, E. Farkas, M. A. Santos, New Aryl-piperazine-Bis(3-Hydroxy-4-Pyridinonate)-IDA in Coadjuvation with a Deferiprone Derivative

for Shuttle Metal Chelation, 12th Int. Conf. Biological Inorganic Chemistry, Ann Arbor, USA, Aug., poster.

Theses

PhD

S. Alves, Complexos com a Unidade fac- $[\text{}^{99\text{m}}\text{Tc}(\text{CO})_3]^+$ para o Desenvolvimento de Radiofármacos Específicos para Receptores de Péptidos, Faculdade de Farmácia, Universidade do Lisboa, 2005. Supervisor: Isabel Santos.

R. Garcia, Complexos Tricarbonilo de Re(I) e Tc(I) com Escorpionatos Doadores de Enxofre - Aplicações no Desenvolvimento de Radiofármacos para Imagiologia Molecular de Receptores do Sistema Nervoso Central, Faculdade de Ciências, Universidade de Lisboa, 2005. Supervisor: António Paulo.

Graduation

M. Videira, Estrogénios Radioiodados para Diagnóstico e Terapia de Tumores da Mama, Faculdade de Ciências, Universidade de Lisboa, 2005. Supervisor: M. C. Oliveira.

B. González, Optimização do Método de Marcação da Eritropoietina com ^{125}I Avaliação *in vitro* e *in vivo*, Escola Superior de Tecnologias da Saúde de Lisboa (ESTeSL), 2005. Supervisor: M. C. Oliveira.

E. Pereira, Avaliação *In Vitro/ In vivo* de Proteínas - $^{99\text{m}}\text{Tc}$ -: Modelo para a Marcação de Eritropoietina com $^{99\text{m}}\text{Tc}$, Escola Superior de Tecnologias da Saúde de Lisboa (ESTeSL), 2005. Supervisor: M. L. Gano and F. Marques.